REMARKS

Claims 1-3 are pending in this application. Claim 3 is canceled. New claims 4-9 are added. Support for new claims 4-9 is found in original claim 3 and the Specification. No new matter is added.

Reconsideration of the application is respectfully requested in view of the above amendments to the claims and the following remarks. For the Examiner's convenience and reference, Applicants' remarks are presented in the order in which the corresponding issues were raised in the Office Action.

Objections to the Drawings

The Examiner's objections to the drawings are noted. Formal drawings are being submitted concurrently herewith to the Official Draftsman.

Sequence Listing

Applicants appreciate the Examiner's approval of the sequence listing submitted January 1, 2002.

Rejections Under 35 U.S.C. § 102(b)

Claims 1-2 remain rejected under 35 U.S.C. § 102(b) as being anticipated by Hu et al. New claims 4-9 depend from claim 1 or claim 2.

The Examiner contends that the Hu *et al.* document "teaches the regulation of Tis-8 (i.e. the rat homologue of Egr-1) in a rat glioma cell line (page 1825, paragraph 3 and Figure 7 of the document)". (Office Action of 23 April 2002).

Applicants respectfully traverse. In support, Applicants submit a Declaration under 37 C.F.R. §1.132 from Dr. Levon Michael Khachigian. The curriculum vitae of Dr. Khachigian establishing his credentials is also submitted herewith.

The Examiner states that Hu *et al.* (1994) teaches the *regulation* of Egr-1 (Tis-8) in glioma cells (emphasis added; citing Figure 7). However, as noted in the declaration of Dr. Khachigian, Figure 7 of Hu *et al.* merely shows that Tis 8 is *expressed* in glioma cells, it does *not* show *regulation* of Tis 8 in glioma cells. Unlike the figures preceding Figure 7 which show the

capacity of atrial natriuretic peptide (ANF) or endothelin (FT-3) to modulate Tis-8 expression in astrocytes, Figure 7 demonstrates "importantly, (that) both ANP and ET-3 failed to inhibit or stimulate, respectively, the expression of this gene" (Hu *et al.* page 1825, paragraph 3, lines 8-10). This is mentioned again in the legend to Figure 7 ("there was no effect of either ANP or FT on Tis 8 expression in these cells", Hu *et al.* page 1825), and in the Discussion ("our findings in glioma cells indicate that ANP can not inhibit and endothelin can not stimulate the basal high expression of this gene", Hu *et al.* page 1826, paragraph 4, lines 1-3). This disparity in Tis 8 responsiveness to ANP or FT-3 in astrocytes and glioma cells was noted, as the authors indicate, despite both these cells having being "well characterized as having both ANF and FT cell surface receptors" by other groups, including the authors themselves (Hu *et al.* page 1825, paragraph 3, lines 2-5). Based on their findings that ANP and endothelin do not affect the expression of Tis-8 in glial cells, the authors suggest that the mechanism controlling Tis-8 expression in cultured glia/glioma cells "is lacking" in astrocytes (Hu *et al.* page 1826, paragraph 4, lines 3-4). Therefore, Hu *et al.*does not teach compounds capable of regulating or specifically inhibiting Tis-8 expression or activity in glioma cells.

Pending claim 1, as amended, specifies a "method of screening for compounds which inhibit proliferation of cells selected from the group consisting of vascular cells and neoplasia cells" the screening being dependent on "the ability of a putative compound to inhibit induction of Egr-1, decrease expression of Egr-1 or decrease the nuclear accumulation or activity of the Egr-1 gene product." In contrast, Hu *et al.* (1994) does not specify methods to screen for compounds which can inhibit proliferation of vascular and neoplasia cells. Hu *et al.* discloses the intracellular pathway by which ANP and ET-3 regulate astrocyte proliferation. However, as noted by Dr. Khachigian, astrocytes are <u>not</u> any type of vascular or neoplastic cell.

Further, as discussed above Hu *et al.* (1994) did not find that Tis-8 expression was altered by ANP and FT-3 in glioma cells and do not teach or suggest any means of regulating Tis-8 in glioma cells. By contrast, regulation of Tis-8 in glial cells using agents such as antisense Tis-8 oligonucleotides is taught in the Specification of the present invention.

Therefore, Applicants submit that since Hu *et al.* do not teach or suggest a "method of screening for compounds which inhibit proliferation of cells," the screening being dependent on the ability of the putative compound to *regulate* Egr-1 activity in "vascular cells and neoplasia cells" as specified in amended, independent claim 1, it does not anticipate claim 1. Since claims 2 and 4-9 depend from independent claim 1, Applicants respectfully request that the rejection under 35 U.S.C. §102(b) be withdrawn.

Rejections Under 35 U.S.C. § 103(a)

Claims 1-3 are rejected under 35 U.S.C. § 103(a) as being unpatentable for obviousness over Mendelsohn et al. (U.S. Pat. No. 5,728,534, "'534 patent"). Claim 3 is canceled. New claims 4–9 depend from claims 1 and 2 and specify the same subject matter as claim 3 (now canceled).

As noted in the declaration of Dr. Khachigian, Mendelsohn discloses agents which (i) inhibit vascular smooth muscle cell activation and/or proliferation; (ii) enhance vascular endothelial cell activation and I or proliferation; or (iii) activate estrogen responsive genes in vascular cells, are useful as putative therapeutic agents for cardiovascular disease (see column 1, lines 43 to 49). The document teaches that methods for screening for vasoprotective agents can include (i) examining the effect of the candidate agent on cell activation and I or proliferation; or independently (ii) examining the effect of a candidate agent on the expression of an estrogen responsive gene.

The Examiner states that Mendelsohn provides screening methods that can be used to identify vasoprotective agents which inhibit vascular smooth muscle cell activation and/or proliferation, enhance vascular endothelial cell activation and/or proliferation, or activate estrogen responsive genes in vascular cells. Hence, the Examiner concludes that Mendelsohn teaches methods of identifying vasoprotective agents by their ability to influence the expression of an estrogen responsive gene. Further, the Examiner acknowledges that Mendelsohn does not specifically describe a method of screening for compounds that inhibit proliferation of cells based on their ability to inhibit Egr-1. (Office Action, page 4, paragraph 2)

The Examiner notes that Mendelsohn states that a preferred effect of the potential vasoprotective agent on the expression of Egr-1 is to decrease (-/-) the expression of Egr-1 in vascular smooth muscle cells and vascular endothelial cells ('534 patent, column 11: 46-48, and 54). However, as noted in the accompanying Rule 132 Declaration of Dr. Khachigian, this directly contradicts Mendelsohn's stated purpose of screening for agents that "activate estrogen responsive genes in vascular cells" as such agents are "potentially useful for treatment and prevention of vascular disease." (U.S. Pat. No. 5,728,534, column 1, lines 43 to 49; column 1, line 64 to column 2, line 7; column 12, lines 25-27). Egr-1 is stated to have an atheroprotective function (column 1, paragraph 5) and is an estrogen responsive gene ('534 patent, column 11, lines 22 to 29). Screening for agents that inhibit expression of Egr-1 in both vascular smooth muscle cells and vascular endothelial cells would yield agents that are inoperable as vasoprotective agents. Therefore, even a statement that a preferred agent would inhibit (-/-) Egr-1 expression in vascular endothelial cells and vascular smooth muscle cells would not suggest to one skilled in the art of cell biology to screen for agents having these properties because inhibiting Egr-1 activity is contradictory to the overall teachings of the '534 patent and the problems it seeks to address.

As further noted by Dr. Khachigian, while Mendelsohn asserts that a preferred agent would inhibit vascular smooth muscle cell activation/proliferation or stimulate endothelial cell activation/proliferation, no molecular or cellular biological rationale is provided in the document as to why the expression of Egr-1 should be increased or decreased by the preferred agent, beyond mere responsiveness to estrogen. Moreover, there is no primary data, published during or before 1994, of which Dr. Khachigian is aware or has been cited by the Examiner, that suggests that estrogen can even induce Egr-1 expression in vascular smooth muscle cells or endothelial cells.

In the section of the '534 patent cited by the Examiner, no sound rationale is provided for the desired outcomes among the genes whose expression would be increased or decreased by a preferred agent (see column 11), . For example, in vascular endothelial cells, Mendelsohn asserts

that the preferred agent would inhibit (-) Egr-1 expression, but stimulate (+) c-Fos expression, whereas in vascular smooth muscle cells, the preferred agent would inhibit both factors. Egr-1 and c-Fos are both immediate early genes and nuclear transcription factors, claimed to be induced by estrogen, that switch on the expression of mitogenic genes. Mendelsohn provides no teaching as to why a "preferred" agent would inhibit one transcription factor and yet stimulate the other, or behave differently in different cells, and the desirability of obtaining such an agent.

Therefore, in view of the contradictions discussed in the preceding paragraphs and in the Declaration of Dr. Khachigian, the Mendelsohn patent does not teach or suggest to a person of ordinary skill in the field of cell biology to arrive at the invention specified in pending claims 1 and 2. On the contrary, the stated purpose of Mendelsohn's patented invention of screening for agents that "activate estrogen responsive genes in vascular cells" as such agents are "potentially useful for treatment and prevention of vascular disease" **teaches away** from screening for agents that **inhibit** "estrogen responsive genes in vascular cells."

Pending claims 4-7 (specifying the same subject matter as original claim 3, now canceled) specify that the method is suitable for *inhibiting both* vascular smooth muscle cells *and* vascular endothelial cells. By contrast, Mendelsohn teaches away from the invention by disclosing inhibition of the proliferation of vascular smooth muscle cells but enhancement of the proliferation of vascular endothelial cells are required (see column 1, lines 51 to 63).

Pending claims 8-9 specify that the method is suitable for inhibiting proliferation *specifically* of neoplasia cells. There is no suggestion in Mendelsohn of a method of screening for compounds which can inhibit proliferation of neoplasia cells. In fact, as noted by Dr. Khachigian, neoplasia cells are not even discussed in Mendelsohn.

The pending claims specify screening for compounds which inhibit proliferation of vascular (smooth muscle cells and endothelial cells) and neoplasia cells, selected by their ability to *inhibit* Egr-1 expression or activity. Mendelsohn' patented invention relates to vasoprotective agents which "activate estrogen responsive genes in vascular cells." The passage cited by the Examiner from the section entitled "Reporter Constructs" contradicts the overall teaching of the

patent as well as the stated purpose of "Assays Based on Estrogen Responsive Reporters" which states that "[a]gents which *activate* expression of estrogen responsive genes in vascular cells . . . are candidate vasoprotective agents." (emphasis added; '534 patent, col. 12, lines 24-27).

Thus, one of skill in the art would find no motivation from Mendelsohn to arrive at the present invention. On the contrary, Mendelsohn teaches away from the claimed invention as there is no motivation to screen for compounds that *inhibit* Egr-1 expression or activity as such agents are **not** candidate vasoprotective agents according to Mendelsohn. Based on the (lack of) applicability to Mendelsohn's invention and the inherent contradiction in the list of preferred responses specified in the '534 patent (Col. 11) as noted in Dr. Khachigian's opinion, Applicants respectfully traverse the Examiner's position that a prima facie case for obviousness has been made. Therefore, Applicants respectfully request that the rejection of these claims under 35 U.S.C. §103(a), be withdrawn.

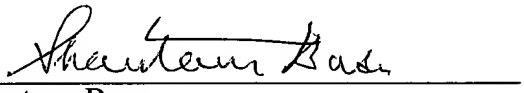
Conclusion

In light of the Amendments and the arguments set forth above, Applicants earnestly believe that they are entitled to a letters patent, and respectfully solicit the Examiner to expedite prosecution of this patent application to issuance. Should the Examiner have any questions, the Examiner is encouraged to telephone the undersigned.

With respect to all amendments and cancelled claims, Applicants have not dedicated or abandoned any unclaimed subject matter and moreover have not acquiesced to any rejections and/or objections made by the Patent Office. Applicants reserve the right to pursue prosecution of any presently excluded claim embodiments in future continuation and/or divisional application.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. 529282000220.

Respectfully submitted,

Dated: October 23, 2002 By: 

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CURRICULUM VITAE

Name Associate Professor Levon Michael KHACHIGIAN,
B.Sc. (Hons. I), Ph.D. *(UNSW)*

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School of Medical Sciences
Faculty of Medicine
The University of New South Wales
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RYDE NSW 2112
Tel. +61-2-9808 3305

Date of Birth March 6, 1964

Sex Male

Marital Status Married, one child

Nationality Australian

ABN: 72 282 756 309

Education

1993 Ph.D. in Molecular Biology (Medicine), UNSW

1986 B. Sc. (Honours, 1st Class in Biochemistry), UNSW

1985 B. Sc., Biochemistry and Microbiology, UNSW

RESEARCH AND ACADEMIC APPOINTMENTS

2001- NHMRC Principal Research Fellow

Associate Professor of Pathology, UNSW (s8571226)

2000 Senior Lecturer (Senior Research Fellow) in Pathology, UNSW

Deputy Manager (Senior Hospital Scientist), Centre for Thrombosis and Vascular Research, South Eastern Area Laboratory Services, South Eastern Sydney Area Health Service Emp. No. 28806

	Senior Lecturer in Biochemistry and Molecular Genetics, UNSW
1999	NHMRC Research Fellow, Level 3
1997-9	NHMRC R. Douglas Wright Research Fellow, Centre for Thrombosis and Vascular Research, School of Pathology, UNSW
	Conjoint Lecturer in Pathology, School of Pathology, UNSW
	Adjunct Lecturer in Biochemistry, School of Biochemistry and Molecular Genetics, UNSW
1995-6	NHMRC C.J. Martin Research Fellow (Australian leg), Centre for Thrombosis and Vascular Research, School of Pathology, UNSW
1995	Instructor (Harvard Faculty) in Pathology, Department of Pathology, Harvard Medical School, Boston, MA
	N.I.H. Postdoctoral Research Fellow, Vascular Research Division, Department of Pathology, Brigham and Women's Hospital & Harvard Medical School, Boston, MA
1993-5	NHMRC C.J. Martin Postdoctoral Research Fellow (Overseas leg), Vascular Research Division, Department of Pathology, Brigham and Women's Hospital & Harvard Medical School, Boston, MA
	J. William Fulbright Postdoctoral Research Fellow, Vascular Research Division, Department of Pathology, Brigham and Women's Hospital & Harvard Medical School, Boston, MA
	Rotary Foundation International Ambassadorial Fellow, Vascular Research Division, Department of Pathology, Brigham and Women's Hospital & Harvard Medical School, Boston, MA
1992	Senior Research Assistant, NSW State Cancer Council, Department of Haematology, The Prince of Wales Hospital, Randwick
1988-92	Ph.D. Student, Faculty of Medicine, UNSW
1986-7	NHMRC Research Assistant, UNSW School of Medicine, The St George Hospital, Kogarah
1985	B.Sc. (Hons. I), School of Biochemistry, UNSW

DEGREES, PRIZES, DISTINCTIONS

2002	RT Hall Prize, Cardiac Society of Australia & New Zealand (for "a substantial body of work contributing to knowledge in cardiology at the highest international level")

2001	NHMRC Principal Research Fellowship
	The 2001 Eppendorf Award for the Young Australian Researcher (Inaugural) (for "outstanding contributions to Australian scientific research based on molecular biology methods, including novel analytical concepts")
	The 2001 AMGEN Medical Researcher Award (AMGEN/Australian Society for Medical Research; for "demonstrated independence, excellence, innovation and achievements in medical research, with evidence of translation from bench to potential for application, particularly over last 2 years")
	The 2001 Young Tall Poppy Award (from the Australian Institute of Political Science; for "achievements of outstanding young researchers in the sciences and biomedical sciences")
	The 2001 James Smillie Research Award, National Heart Foundation of Australia; for "for top ranking National Heart Foundation research grant"
	Barbara Ell Medal, Victor Chang Cardiac Research Institute
	Outstanding Paper Award, 6th Saratoga International Conference on Atherosclerosis, Mejiro, Japan
2000	Senior Lecturer in Pathology, UNSW
1999	NHMRC Research Fellowship (L3)
1997-1999	NHMRC R. Douglas Wright Research Fellowship
1997	The 1997 Glaxo-Wellcome Australia Research Award
1993-1996	NHMRC C.J. Martin Postdoctoral Research Fellowship
1995	Instructor in Pathology and Member of the Faculty, Harvard Medical School
1993-1995	J. William Fulbright Postdoctoral Research Award, Australian-American Educational Foundation
1993-1994	Rotary Foundation International Ambassadorial Award
1994	Occasional Lecturer Travel Award, Council for International Exchange of Scholars, Washington, DC
1993	Doctor of Philosophy, Faculty of Medicine, UNSW

1991	Faculty of Medicine Postgraduate Research Scholarship, UNSW
1990-1991	Australian Postgraduate Research Award
1989	Selected Participant, A National Vision, National Forum of the Queen Elizabeth II Silver Jubilee Trust for Young Australians, Flinders University, Adelaide
1988	The Queen Elizabeth II Silver Jubilee Trust Award for Young Australians
1986	First Class Honours in Biochemistry, Bachelor of Science, UNSW
1985	Vacation Scholarship, National Heart Foundation of Australia

Other Distinctions

2002	Finalist (1 of 3), The University of New South Wales Eureka Prize for Scientific Research, The Australian Museum
2001	Finalist (1 of 4), The University of New South Wales Eureka Prize for Scientific Research, The Australian Museum
2000	Merck & Co., Inc. Travel Grant, IIIrd International Forum on Angiotensin II Receptor Antagonism, London, England
	UNSW School of Pathology Outstanding Scientific Research Paper Award
	Adjunct Senior Lecturer in Biochemistry and Molecular Genetics, UNSW
1999	Merck & Co., Inc. Travel Grant, IInd International Forum on Angiotensin II Receptor Antagonism, Monte-Carlo, Monaco
	National Heart Foundation of Australia Travel Grant, International Forum on Angiotensin II Receptor Antagonism, Monte-Carlo, Monaco
1997	National Heart Foundation of Australia Travel Grant, XIth International Symposium on Atherosclerosis, Paris, France
	UNSW School of Pathology "Achiever of the Year" Award
	Conjoint Lecturer in Pathology, UNSW
	Adjunct Lecturer in Biochemistry and Molecular Genetics, UNSW

1996 National Heart Foundation of Australia Travel Grant, IXth International Vascular Biology Meeting, Seattle, WA

1994 Travel Award, VIIIth International Vascular Biology Meeting, Heidelberg, Germany

1993 Young Investigators Travel Award, XIVth Congress of the International Society of Thrombosis and Hemostasis, New York, NY

1992 Finalist, Tow Prize, Prince of Wales/Prince Henry Hospitals

1989 Travel Award, XXVIIIth National Scientific Conference, Australian Society for Medical Research, Adelaide

1988 Travel Award, XXVIIth National Scientific Conference, Australian Society for Medical Research, Canberra

RESEARCH GRANTS

Current

2003-5 Khachigian LM. PKC-zeta-dependent Sp1 phosphorylation: Identification of phosphorylated amino acids, demonstration of functional significance, generation and use of novel phospho-specific Sp1 antibodies. ARC Discovery Project DP0345071 ($75,000 in 2003, $70,000 in 2004, $65,000 in 2005)

2002-4 Khachigian LM. Principal Research Fellowship Package plus industry Support Enhancement Option, NHMRC (Application ID 209655) ($130,000 p.a.)

2002-6 Chesterman CN, Andrew RK, Berndt MC, Chong BH, Hogg PJ, Hulett M, Khachigian LM, Parish CR. *Vascular biology*, New Program Grant 983213; NHMRC Application ID 209618 ($2,000,000 p.a.)

2002 Khachigian LM. *DNAzymes as therapeutic tools in angiogenesis and restenosis.* Johnson and Johnson Research Pty Limited ($153,379)

2002-3 Haber M, Norris M, Khachigian LM. *Down-regulation of N-myc oncogene expression as a therapeutic strategy for childhood neuroblastoma*, NHMRC Project Grant (Application ID 209600) ($75,907 in 2002, $88,504 in 2003)

2002 Wakefield D, Cunningham A, Geczy C, Grimm M, Halliday G, Hogg P, Hunt J, Khachigian LM, Kumar RK, Lloyd A, McNeil P, Symonds G. *The UNSW Laser Capture Microdissection Facility*. NHMRC Equipment Grant ($191,192)

2001-2 Khachigian LM. *Activation of YY1 by arterial injury: identification and elucidation of underlying molecular mechanisms*, National Heart Foundation of Australia G00S-0702 ($36,300 in 2001, $36,300 in 2002)

2000-3 Chesterman CN, Chong BH, Hogg PJ, Khachigian LM, Owensby DA, Wilcken DEL, *Research Infrastructure Grant*, NSW Department of Health ($645,000 p.a.)

Previous

2001 Khachigian LM. *DNAzymes as potential therapeutic tools in restenosis and cancer*, Johnson and Johnson Research Pty. Limited ($127,576)

Khachigian LM. Catalytic DNA as molecular inhibitors of the cellular response to injury, UNSW Research Support Program ($7000 p.a)

2000-1 Chesterman CN, Khachigian LM, *Mechanisms of TGF-beta1-inducible growth factor gene expression and apoptosis in vascular endothelial cells*, National Heart Foundation of Australia G99S-0456 ($51,687 in 2000, $53,044 in 2001)

Lowe HC, Juergens CP, Chesterman CN, Khachigian LM. *MAVERiC (Mechanisms of action in vivo-examining responses to Tranilast in smooth muscle cells)-a PRESTO substudy*, SmithKline Beecham International ($10,000)

1998-2001 Chesterman CN, Chong BH, Hogg PJ, Khachigian LM, Owensby DA, *Vascular biology in thrombosis*. NHMRC Program Project 983213 ($667,115 in 1998, $766,020 in 1999, $813,386 in 2000, $813,386 in 2001)

2000 Khachigian LM, Lowe HC, *Novel catalytic DNAzymes targeting EGR-1 to reduce restenosis in a porcine coronary stent model*, Johnson & Johnson Research Pty Limited ($43,312)

Khachigian LM. *Early growth response factor-1 as a key transcriptional mediator in vascular disease and diabetes mellitus*, ARC Small Grant, UNSW ($6,000)

1998-2000 Khachigian LM, *Molecular strategies to control vascular cell proliferation.* ARC SPIRT C098-04441 ($92,520 in 1998, $98,500 in 1999, $101,200 in 2000) (Matching funds from with Johnson & Johnson Research Pty Limited)

1999-2000 van Ryke DM, Jessup W, Brown A (Dean R, Khachigian LM, Associate Investigators). *Pro-inflammatory effects of human macrophages mediated by oxysterols*, National Heart Foundation of Australia G98S-0052 ($58,942 in 1999, $58,942 in 2000)

1999 Centre for Thrombosis and Vascular Research Investigators, *Functional Genomics Facility*, based at the University of New South Wales ($750,000). *In collaboration with the UNSW Schools of Biochemistry, Microbiology, The Garvan Institute, Victor Chang Cardiac Research Institute, The University of Sydney, Macquarie University, and Westmead Hospital.

1998-9 Khachigian LM, *Transcriptional regulation of platelet-derived growth factor in vascular smooth muscle cells.* National Heart Foundation of Australia G97S-4828 ($46,800 in 1998, $46,800 in 1999)

1997-9 Khachigian LM, *Regulation of PDGF gene expression by Egr-1 in normal and pathological settings.* National Health and Medical Research Council of Australia (R. Douglas Wright Award) 977722 ($59,511 in 1997; $62,292 in 1998; $64,181 in 1999). Incorporated into NHMRC Program in 1998

1996-7 Khachigian LM, *Prevention of proliferation of vascular cells.* Johnson & Johnson Research, Pty. Ltd. (J&JR subcontract) ($85,799)

1997 Khachigian LM, *Regulation of PDGF gene expression by Egr-1.* Merck Sharp & Dohme Pty. Ltd. M3154M ($40,000)

1992 Chesterman CN, Khachigian LM, *A peptide of PDGF A-chain as an antiproliferative agent.* NSW State Cancer Council ($47,925)

Chesterman CN, Khachigian LM, *PDGF-A peptide as an antiproliferative agent.* Johnson & Johnson Research Pty. Limited (JJR subcontract) ($80,000)

TEACHING, THESIS MARKING, AND INSERVICE LECTURES

2002 UNSW Department of Pathology, "Cutting Edge Technologies" series for *Molecular Basis of Disease A* (Lectures, Tutorials, Laboratory Practicals)

UNSW Department of Pathology, "Processes in Disease" (Lectures)

UNSW Department of Pathology, *Biotechnology and Genetic Engineering: The Search for Better Health - Professional Development* (Lectures)

UNSW Department of Physiology and Pharmacology, *Advanced Pharmacology, Master's Degree in Biopharmaceuticals* (Lectures)

Ph.D. Examiner, Department of Molecular Biosciences, University of Adelaide

	B.Sc. (Hons) Examiner, UNSW School of Physiology and Pharmacology
2001-	UNSW School of Pathology, "Cutting Edge Technologies" series for *Molecular Basis of Disease A* (Lectures, Tutorials, Laboratory Practicals) **NB.** Dr Khachigian achieved a score of 3.875/4.0 from students in this course based on anonymous ranking.
	UNSW School of Pathology, *Biotechnology and Genetic Engineering: The Search for Better Health - Professional Development* (Lectures)
	UNSW Faculty of Medicine Research Student Induction/Training Program, "How to write a competitive scholarship and fellowship application" (Lectures)
	UNSW School of Pathology, *Biotechnology: The Search for Better Health - Professional Development* (Lectures)
2000	M.Sc. Examiner UNSW School of Biochemistry and Molecular Genetics
1999-	UNSW School of Pathology, *Genes, Germs and Genomes* (Lectures, Laboratory Practicals)
1999	Ph.D Examiner, Monash University
1997-	UNSW Biochemistry and Molecular Genetics, *Molecular Cell Biology*, BIOC 3271 (Lectures)
	UNSW School of Pathology, *Mechanisms of Human Disease*, PATH 3202
	UNSW School of Pathology, *Miracles and Misadventures in Modern Medicine*, GENM1000 (Lectures)
1993-95	Harvard Medical School, *Metabolism and Function of Human Organ Systems* (Discussion Group Leader in Biochemistry and Molecular Biology)
1990	School of Biological and Biomedical Sciences, University of Technology, Sydney (Biochemistry 1), Laboratory Demonstrator in Biochemistry
1989	Tutor in Chemistry, Collmark Coaching Colleges, Eastwood
	Tutor in Chemistry, Abacus Coaching College, West Ryde
1988	Tutor in Chemistry, Educational Division, Austral-Armenian Society, Frenchs Forest

1985 Tutor in Biochemistry, School of Biochemistry, UNSW (Undergraduate Medicine Program)

Demonstrator in Biochemistry, School of Biochemistry, UNSW (Undergraduate Medicine Program)

SUPERVISION OF POSTDOCTORAL RESEARCHERS

2003 Dr Melanie Eyres, Centre for Thrombosis and Vascular Research (A/Prof Khachigian, sole supervisor)

2002 Dr Pooli Rajasekariah, Centre for Thrombosis and Vascular Research (A/Prof Khachigian, sole supervisor)

Dr Cuili Zhang, Visiting Research Fellow at Centre for Thrombosis and Vascular Research from Hunan Medical University, China (A/Prof Khachigian, sole supervisor)

Dr Angela Lai, Centre for Thrombosis and Vascular Research (A/Prof Khachigian, sole supervisor)

2001- Dr Harry Lowe, Centre for Thrombosis and Vascular Research (A/Prof Khachigian, sole supervisor), commenced a C.J. Martin Fellowship at Harvard Medical School in June 2001

2001 Dr Louise Rafty, Centre for Thrombosis and Vascular Research (A/Prof Khachigian, sole supervisor), commenced a C.J. Martin Fellowship at University of Oregon in November

2000 Dr Toshifumi Tetsuka, Visiting Research Fellow at Centre for Thrombosis and Vascular Research from Nagoya City University Medical School (A/Prof Khachigian, sole supervisor)

Dr Keiko Yano, Visiting Research Fellow at Centre for Thrombosis and Vascular Research from Nagoya City University Medical School (A/Prof Khachigian, sole supervisor)

1999 Dr Mo Yang, Centre for Thrombosis and Vascular Research (Prof B.H. Chong, supervisor)

1996-8 Dr Gabrielle Delbridge, Centre for Thrombosis and Vascular Research (Prof C.N. Chesterman, supervisor)

1994-8 Dr Eric Silverman, Vascular Research Division, Department of Pathology, Harvard Medical School (Prof T. Collins, supervisor)

POSTGRADUATE STUDENT SUPERVISION

(i)	Ph.D.
2003-	Ms Melanie Murrell, Department of Cardiology, Royal North Shore Hospital (Dr Michael Ward, co-supervisor)
2002-	Dr Guishui Zhang, Centre for Thrombosis and Vascular Research, UNSW
	Ms Michelle Bonello, Centre for Thrombosis and Vascular Research, UNSW
	Mr Fernando Santiago, Centre for Thrombosis and Vascular Research, UNSW
2001	Dr Wendy Lipworth, Centre for Thrombosis and Vascular Research, UNSW (Prof Chesterman, co-supervisor)
2000-	Ms Mary Kavurma, Centre for Thrombosis and Vascular Research, UNSW, 6/2/00-present (A/Prof Khachigian, sole supervisor)
1999-	Mr Michael Eisbacher, Centre for Thrombosis and Vascular Research, UNSW (Prof B.H. Chong, supervisor)
	Ms Louise Larkin, Heart Research Institute, University of Sydney (Dr W. Jessup, supervisor)
1998-2001	Ms Louise Rafty, Centre for Thrombosis and Vascular Research, UNSW (A/Prof Khachigian, sole supervisor)
1998-2000	Dr Harry Lowe, Centre for Thrombosis and Vascular Research, UNSW (Prof C.N. Chesterman, co-supervisor)
	Ms Renita Sangaran, Centre for Thrombosis and Vascular Research, UNSW (Prof B.H. Chong, supervisor)
1993-5	Ms Amy Williams, Vascular Research Division, Department of Pathology, Harvard Medical School (Prof T. Collins, supervisor)
(ii)	*B.Sc. (Hons)*
2001	Ms Michelle Bonello, Centre for Thrombosis and Vascular Research, UNSW (Dr Khachigian, sole supervisor)
	Mr Vinh Dao, Oncology Research Centre, Prince of Wales Hospital, Randwick (Dr Paul Jackson, co-supervisor)
2000	Ms Anastasia Kaniaros, Centre for Thrombosis and Vascular Research, UNSW (Dr Khachigian, sole supervisor)

(iii) *International Scholars*

2000 Ms Natalia Gousseva, International Society for Thrombosis and Haemostasis / World Heart Association Scholar from Lomonosov Moscow State University (Prof C.N. Chesterman, co-supervisor)

Ms Alison Douglass, Harvard Medical School (Dr Khachigian, sole supervisor)

COMPETITIVE PRIZES WON BY A/PROF KHACHIGIAN'S RESEARCH PERSONNEL

2001 Mr Michael Eisbacher, Young Investigator Award, St George Hospital Medical Symposium

Mr Michael Eisbacher, Student Travel Award, American Society for Haematology

Ms Mary Kavurma, Australian Vascular Biology Society Young Investigator Travel Award, International Vascular Biology Meeting, Karuizawa, Japan

Ms Mary Kavurma, Silver Medallist, 10th National Scientific Conference of the Australian Vascular Biology Society, Hunter Valley, NSW

Ms Michelle Bonello, Honorable Mention, 10th National Scientific Conference of the Australian Vascular Biology Society, Hunter Valley, NSW

Dr Guishui Zhang, University Postgraduate Research Scholarship

Ms Michelle Bonello, Australian Postgraduate Research Award

2001 Dr Harry Lowe, C.J. Martin Postdoctoral Research Award, NHMRC

Dr Louise Rafty, C.J. Martin Postdoctoral Research Award, NHMRC

Dr Wendy Lipworth, NHMRC Medical Postgraduate Research Scholarship

Ms Mary Kavurma, Young Investigator Award, Australian Vascular Biology Society

Ms Michelle Bonello, First Class Honours in Pathology

2000 Ms Anastasia Kaniaros, First Class Honours in Pathology

Ms Natalia Gousseva, UNSW School of Pathology Best Poster Award

Dr Harry Lowe, Bayer Travelling Fellowship to attend 49th Annual Scientific Session of the American College of Cardiology, Anaheim

Dr Harry Lowe, Roche/Cardiac Society of Australia and NZ Annual Scientific Meeting Scholarship to attend 2000 CSANZ Meeting, Melbourne

Mr Michael Eisbacher, Ibsen Medal, 8th Congress of the World Apheresis Association / 2nd Annual Scientific Meeting of the Haematology Society of Australia and New Zealand / 34th Annual Scientific Meeting of the Australasian Society for Blood Transfusion, Perth

Dr Toshifumi Tetsuka, Academic Exchange Program between the UNSW Faculty of Medicine and Nagoya City University Medical School

Dr Keiko Yano, Academic Exchange Program between the UNSW Faculty of Medicine and Nagoya City University Medical School

1999 Ms Natalia Gousseva, International Thrombosis and Vascular Training Centre Fellowship

Ms Louise Rafty, Young Investigator Award, UNSW School of Pathology Research Day

Dr Harry Lowe, Tow Prize, Prince Henry Hospital/Prince of Wales Hospitals

1998 Mr Fernando Santiago, Bio-Rad Technical Prize, ASMR Medical Research Week, Australian Museum, Sydney

Dr Harry Lowe, NHMRC Medical Postgraduate Research Scholarship

SUPERVISION OF NON-STUDENT RESEARCH PERSONNEL

Dr Gabrielle Delbridge, Research Assistant, NHMRC, 9500110, 1/1/96-31/12/97

Mr Fernando Santiago, Research Assistant, JJR, 9601023, 21/10/96-31/12/97; Research Assistant, ARC SPIRT, 1/12/98-18/1/99, Research Assistant, NHMRC, 19/1/99-present

Dr Louise Rafty, Research Assistant, MSD, 9601301, 11/11/96-31/12/97

Ms Onza Chan, Research Assistant, NHMRC, 9800339, 19/1/98-18/1/99

Ms Fiona Day, Research Assistant, NHMRC, 9704633, 2/2/98-31/12/98

Ms Mary Kavurma, Research Assistant, ARC SPIRT, 9701482, 6/2/98-5/2/00

Ms Kumi Kugathasan, Research Assistant, NHMRC, 9801530, 2/2/99-1/2/00

Ms Lisa Taylor, Research Assistant, NHF 967486, 20/7/98-31/3/00

Ms Michelle Costandi, Research Assistant, ARC SPIRT, 9900886, 8/3/99-4/2/00

Mr Roger Fahmy, Research Assistant, ARC SPIRT, 9900845, 21/2/00-present

Ms Aiping Liu, Research Assistant, NHMRC, 3000483, 20/3/00-21/7/00

Ms Mercedes Ballesteros, Research Assistant, NHMRC, 8112829, 5/2/01-31/12/01

Ms Marjorie Liu, Research Assistant, NHF, 3015628, 5/2/01-31/12/01

Dr Angela Lai, NHMRC Research Officer, 2223341, 29/1/02-27/7/02

Ms Ainslee Mitchell, Research Assistant, JJR, 18/3/02-present

Dr Pooli Rajasekariah, NHMRC Senior Research Officer, 1/5/02-present

GRANT ASSESSMENT AND ADMINISTRATION

2002 Member, National Heart Foundation Regional Grants Interviewing Committee (Panel 3)

2001-2 Member, NHMRC *Cell Biology* Grant Review Panel (1D)

EDITORIAL RESPONSIBILITIES

2001-5 Editor, *Thrombosis Research*

2002- Editorial Board, *Endothelium*

2002- Editorial Board, *Journal of Cardiothoracic-Renal Research*

2001- Editorial Board, *LifeXY*

INVITED REFEREE FOR MANUSCRIPTS SUBMITTED FOR PUBLICATION

2002 *Circulation*
Blood
Arteriosclerosis, Thrombosis and Vascular Biology
Oncogene
Current Drug Targets
Molecular and Cellular Endocrinology
Biochimica et Biophysica Acta

2001 *Circulation*
Circulation Research

Blood
Molecular and Cellular Biochemistry
Arteriosclerosis, Thrombosis and Vascular Biology
Cancer Research
Biochemical Pharmacology
Clinical and Experimental Pharmacology and Physiology
International Journal of Biochemistry and Cell Biology

2000 *Nature Medicine*
Circulation
American Journal of Pathology
Circulation Research
Arteriosclerosis, Thrombosis and Vascular Biology
Journal of Histochemistry and Cytochemistry
Clinical and Experimental Pharmacology and Physiology
Thrombosis and Haemostasis

1999 *Journal of Biological Chemistry*
Circulation Research

1998 *American Journal of Pathology*
Journal of Clinical Investigation
Molecular Medicine Today
Circulation Research

1997 *American Journal of Pathology*
Biochimica et Biophysica Acta
Circulation Research
Immunology and Cell Biology

1995 *American Journal of Pathology*
American Journal of Physiology
Circulation Research
FASEB Journal

1994 *Circulation Research*
Peptides

EXTERNAL ASSESSOR OF PROJECT GRANT AND FELLOWSHIP APPLICATIONS

2002 NHMRC Research Fellowship Applications

Senior Medical Research Fellowships, Sylvia and Charles Viertel Charitable Foundation

Cancer Council Victoria

2000 Harvard Medical School Promotions Committee

	University of Adelaide Medical Research Associateship
1999	Anti-Cancer Foundation of South Australia
1996-	National Health and Medical Research Council of Australia
	National Heart Foundation of Australia
1996	Australian Research Council (Small Grants)
	Health Research Council of New Zealand
	Sylvia and Charles Viertel Foundation

COMMITTEE AND ORGANISATIONAL ASSIGNMENTS

(a) Scientific Society Committees

2002-5	Director, 2005 ISTH Inc
2001-3	President, Australian Vascular Biology Society
	Education Committee, Australian Vascular Biology Society
2002-	National Director, Board of the Australian Society for Medical Research
1999-2001	Committee, Australian Vascular Biology Society
1989-92	President, Biochemical Graduates Association, UNSW
1986-89	Board Member, Biochemical Graduates Association, UNSW

(b) Scientific Conference Convenor, Committee, Invited Chair or Judge

2002-	Treasurer, XXth Scientific Conference for International Society for Thrombosis and Haemostasis, Sydney, 2005
	Scientific Advisory Board, XIIIth International Vascular Biology Meeting, Toronto, Canada 2004
	Judge, ASMR National Research Award
2002	Convenor, 10th Meeting of the Australian Vascular Biology Society, Hunter Valley, NSW
	Faculty, 2nd Annual Meeting of the Asian-Pacific Cardiothoracic-Renal Association, Beijing, China

Scientific Committee, 2nd Annual Meeting of the Asian-Pacific Cardiothoracic-Renal Association, Beijing, China

Chairman, "Mechanisms of angiogenesis" session, 13th Great Wall International Congress of Cardiology / 2nd Annual Meeting of the Asian-Pacific Cardiothoracic-Renal Association, Beijing, China

Chairman, "Free papers" session, 13th Great Wall International Congress of Cardiology / 2nd Annual Meeting of the Asian-Pacific Cardiothoracic-Renal Association, Beijing, China

Co-chair, "Biochemical and genetic markers of restenosis" session, World Congress of Cardiology, Sydney

Co-chair, "Inhibition of intimal hyperplasia: pre-clinical studies" session, World Congress of Cardiology, Sydney

Chairman, "Transcriptional Control" workshop, XII International Vascular Biology Meeting, Karuizawa Japan

Judge, Young Investigators' Award, XII International Vascular Biology Meeting, Karuizawa Japan

2001- International Advisor, XII International Vascular Biology Meeting, Karuizawa Japan

Abstract Reviewer, XIVth World Congress of Cardiology 2002

Chairman, *Session II,* 2001 ASMR (NSW) Scientific Meeting, UNSW

2000 Convenor, Sydney Transcription Group, Seventh Meeting, The Prince of Wales Hospital, Randwick NSW

Chairman, "Vessels and Thrombosis" session, Joint Congress of the World Apheresis Association / Haematology Society of Australia and New Zealand / Australasian Society for Blood Transfusion, Perth

Chairman, "Cancer, Metastasis & Thrombosis" session, Joint Congress of the World Apheresis Association / Haematology Society of Australia and New Zealand / Australasian Society for Blood Transfusion, Perth

Chairman, "Postdoctoral Researcher Award" session, UNSW School of Pathology Research Day

Judge, Gordon Conference "Vascular Cell Biology", Plymouth State College, New Hampshire

1999-	Organising Committee, UNSW School of Pathology Annual Research Day
1999	Judge, Australian Society for Medical Research (NSW Division) Scientific Conference, Sydney
1998-9	Convenor and Co-Chairman of Scientific Program, National Scientific Conference, Australian Society for Medical Research, Leura, 1999
1998	Judge, Australian Society for Medical Research (NSW Division) Scientific Conference, Sydney
1997-8	International Advisory Committee, Xth International Vascular Biology Meeting, Cairns, Qld, 1998
1997-	Organising Committee, XXth Scientific Conference for International Society for Thrombosis and Haemostasis, Sydney, 2005
1996-7	Organising Committee, Vth Meeting of the Australian Vascular Biology Society, Leura, NSW, 1997
1996	Public Relations Convenor, Australian Society for Medical Research (NSW Division)
1992	Co-Convenor of Scientific Program, Inaugural Symposium of the Centre for Thrombosis and Vascular Research, The Prince of Wales Hospital, Randwick
1988	Open Day Organising Committee, The St George Hospital, Kogarah

(c) Departmental, Faculty or University Responsibilities (beyond Undergrad /Postgraduate Teaching)

2002	Chairman, Postgraduate Review Panel, School of Medical Sciences, UNSW
	Biological Resources Centre Management Board, UNSW
	Occupational Health & Safety Committee, School of Medical Sciences, UNSW
	Speaker, "Maintaining Effective Postgraduate Supervision", UNSW Staff Development Program
	Co-convenor, School of Medical Sciences Seminar Series
	Member, Medical Student Admission Interview Panel, UNSW
2001-2	Chairman, Small Animal Advisory Group, UNSW Faculty of Medicine

2001	Committee, University Animal Services, UNSW
	Instructor, "Funding for Health and Medical Research in the New Millennium", UNSW Faculty of Medicine
	Instructor, "Scholarships/Fellowship Applications", Faculty Research Student Induction Program, UNSW Faculty of Medicine
	Represented Centre for Thrombosis and Vascular Research at Australian Universities Quality Agency UNSW Audit Visit Program
	Judge, Tow Prize, Senior's Open Division, UNSW
	Judge, Merck Sharp & Dohme Research Student Poster Prize, UNSW Faculty of Medicine
	Participant, School of Medical Sciences Research Retreat, UNSW
2000-	Resources Subcommittee of the Faculty of Medicine Research Management Committee, UNSW
	UNSW Centre for Thrombosis and Vascular Research Scientific Management Committee
	Occupational Health & Safety Committee, School of Pathology, UNSW
	Panel Secretary, Higher Degree Review Committee, School of Pathology, UNSW
	Vice-Chair, Space Allocation Committee, School of Pathology, UNSW
	Radiation Safety Supervisor, School of Pathology, UNSW
2000	Producer, 1999 Annual Report, Centre for Thrombosis and Vascular Research, UNSW
1999	Producer, 1998-9 Annual Report, Centre for Thrombosis and Vascular Research, UNSW
1997-	Convenor, Research Meetings, Centre for Thrombosis and Vascular Research, UNSW
1997	Radiation Safety Coordinator, School of Pathology, UNSW
	Co-convenor, School of Pathology Seminar Series, UNSW
1996	Higher Degree Review Committee, School of Pathology, UNSW

Radiation Safety Committee, School of Pathology, UNSW

1990 Subcommittee on Affiliated Organisations, Board of Alumni Association, UNSW

1987-91 Board Member, Alumni Association of the UNSW

MEMBERSHIP OF PROFESSIONAL SOCIETIES

1997- NHMRC Association of Research Fellows

American Society for Investigative Pathology

1995- Australian Vascular Biology Society

1995 American Society for Investigative Pathology

1994- North American Vascular Biology Organization

1993-4 American Association for the Advancement of Science

New York Academy of Sciences

1989 Australian Society for Immunology

1986- Australian Society for Medical Research

1986 Australian Society for Biochemistry and Molecular Biology

Australian and New Zealand Society for Cell Biology

INVITED LECTURES

2003 *TBA*, Vascular Remodeling in Atherosclerosis and Restenosis, ISA Satellite Symposium, International Atherosclerosis Society, Kobe, Japan

2002 *Control of immediate-early transcription factor gene expression in injured arteries,* 12th International Vascular Biology Meeting, Karuizawa, Japan

DNAzymes as inhibitors of tumor angiogenesis, Johnson and Johnson Research Pty Limited, Sydney

Control of immediate-early transcription factor gene expression in injured arteries, Australian Atherosclerosis Society, Millennium Hotel, Sydney

Egr-1: a master transcriptional regulator in vascular pathologies. Transcriptional control, Department of Molecular Biosciences, Adelaide University

Egr-1: a key mediator of tumor angiogenesis and post-angioplasty restenosis, 2nd Annual Meeting of the Asian-Pacific Cardiothoracic-Renal Association, Beijing, China

Egr-1 in post-angioplasty restenosis, Department of Radiation Oncology, The Prince of Wales Hospital

Insulin and vascular growth regulation by transcription, Inaugural Australian Health and Medical Research Congress, Melbourne Congress Centre

Catalytic DNA defines transcription factor function in the injured artery wall, Anderson Stuart Seminar Series, Departments of Physiology, Anatomy and Histology, University of Sydney

YY-1 as a novel therapeutic agent in post angioplasty restenosis, ARK Therapeutics, London, UK

Catalytic oligodeoxynucleotides as inhibitors of in-stent restenosis, International Society for Applied Cardiovascular Biology, 8th Biennial Meeting, St Gallen, Switzerland

Immediate-early gene expression in injured arteries: DNAzymes as therapeutic agents, 10th Scientific Meeting of the Australian Vascular Biology Society, Hunter Valley, NSW

2001 *Immediate-early genes and the pathogenesis of atherosclerosis.* Regional Center for Atherosclerosis, Ospedale Civile, Venice, Italy

Novel gene-based approaches to combat in-stent restenosis. Department of Radiation Oncology, Prince of Wales Hospital, Randwick.

Yin yang-1 therapy in restenosis. TRANSGENE, Strasbourg, France.

The yin and yang of transcriptional activators and repressors in injured artery wall, 9th Scientific Meeting of the Australian Vascular Biology Society, Noosa Lakes Resort, Qld

Catalytic oligonucleotides targeting human Egr-1 as inhibitors of in-stent restenosis, XVIII Congress of the International Society on Thrombosis and Haemostasis, Paris, France

Catalytic DNA defines transcription factor function in the injured artery wall, Kolling Institute, Royal North Shore Hospital, Sydney

Catalytic DNA defines transcription factor function in the injured artery wall, Baker Medical Research Institute, Melbourne

Restenosis after angioplasty: why does it happen? National Heart Foundation of Australia talk to donors, Zenith Centre, Chatswood

Catalytic DNA as new tools for the control of in-stent restenosis, Cardiovascular Club of NSW, University of Sydney

Catalytic oligonucleotides as inhibitors of in-stent restenosis, Hanson Centre for Cancer Research, Adelaide

Catalytic DNA to define transcription factor function in the artery wall; implications to restenosis, CSIRO Division of Biomolecular Engineering

Catalytic DNA as tools to define gene function, John Curtin School of Medical Research, Australian National University

Catalytic DNA defines early growth response factor-1 as a key positive regulator of cell growth in the vascular response to injury. 2000 Eppendorf Award for the Young Australian Researcher Lecture, Lorne Cancer Conference, Lorne Vic

Early growth response factor-1 as a key positive regulator of cell growth in the vascular response to injury, Barbara Ell Seminar Series, Victor Chang Cardiac Research Institute

Catalytic oligonucleotides targeting human EGR-1 as inhibitors of in-stent restenosis. 6th Saratoga International Conference on Atherosclerosis, Mejiro, Tokyo, Japan

Transcriptional control in the reparative response to acute arterial injury, NSW Cell and Developmental Biology Group

Novel strategies to control restenosis, Pancreas Transplant Unit, Prince of Wales Hospital, Randwick

ISTH'2001 Cutting Edge Research, Department of Haematology, Prince of Wales Hospital, Randwick

2000 *Catalytic DNA as tools to define transcription factor function in the vascular response to injury*, International Keynote Speaker, 8th Japanese Vascular Biology Meeting, Tokyo, Japan

Activation of transcriptional repressors in the injured artery wall. Medical Research Institute, Tokyo Medical and Dental University, Japan

Control of gene expression in the injured artery wall. Institut fur Pathologie der Universitat zu Koln, Germany

Nucleic acids as enzymes with therapeutic potential. Vascular Research Division, Department of Pathology, Brigham and Women's Hospital & Harvard Medical School, Boston

Gene targeting in the control of proliferative vascular disease. Children's Cancer Institute of Australia/Sydney Childrens' Hospital, Randwick

Catalytic DNA defines early growth response factor-1 as a key positive regulator of cell growth in the vascular response to injury, Johnson and Johnson Research Pty. Limited, Sydney

Transcriptional control in vascular endothelial and smooth muscle cells, VIII Annual Scientific Meeting, Australian Vascular Biology Society, Marysville, Vic

Control of gene expression in the injured vessel wall. Ludwig Institute of Cancer Research, Melbourne

Nucleic acids as therapeutic tools: MEKing a difference by ERKing the system. UNSW School of Pathology

Catalytic DNA as molecular tools to dissect biological function. Heart Research Institute, Sydney

Restenosis prevention strategies. Joint Congress of the World Apheresis Association / Haematology Society of Australia and New Zealand / Australasian Society for Blood Transfusion, Perth

Nucleic acids as therapeutic tools. Department of Haematology, The Prince of Wales Hospital, Randwick

ATII-inducible PDGF A-chain gene expression is p44/42 ERK- and Egr-1/NGFI-A-dependent and mediated via the ATII type 1, but not type 2 receptor: induction by ATII antagonized by nitric oxide. IIIrd International Symposium on Angiotensin II Antagonism, London, England

Catalytic DNA as tools to define transcription factor function in the vascular response to injury. Gordon Research Conference "Vascular Cell Biology", Plymouth, New Hampshire

Transcriptional control in the vascular response to injury. XIIth International Symposium on Atherosclerosis, Stockholm, Sweden

1999 *Transcriptional responsiveness in cells of the artery wall.* Department of Physiology and Pharmacology, UNSW

Novel signalling pathways in apoptosis, Children's Cancer Research Institute, Prince of Wales Hospital, Sydney

Mechanisms of angiotensin II induction of PDGF-A in smooth muscle cells. Vascular Research Division, Department of Pathology, Brigham and Women's Hospital & Harvard Medical School, Boston

Control of smooth muscle proliferation by targeting Egr-1. Vascular Research Division, Department of Pathology, Brigham and Women's Hospital & Harvard Medical School, Boston

GC factor 2 represses platelet-derived growth factor A-chain gene expression and is itself induced by arterial injury, Experimental Biology 99, Washington, D.C., USA

1998 *DNAzymes targeting NGFI-A*, R.W. Johnson Pharmaceutical Research Institute, Rushcutter's Bay

Signalling and transcriptional responses to vascular injury, Xth International Vascular Biology Meeting, Cairns, Qld

Why do arteries renarrow after angioplasty? National Heart Foundation of Australia talk to donors, Surrey Hills

Role of the endothelium in coronary heart disease, Haematology Society of Australasia, Darling Harbour Convention Centre, Sydney

Egr-1 and transcriptional activation in vascular cells, School of Pathology, UNSW

bFGF induction of an Egr-1-dependent remodelling cascade, Vascular Research Division, Department of Pathology, Brigham and Women's Hospital, Harvard Medical School, Boston, MA

Vascular smooth muscle cell proliferation and regrowth after injury in vitro is dependent upon Egr-1, 37th National Scientific Conference, Australian Society for Medical Research, Hobart, Tas

1997 *Signalling and transcriptional control in the response to injury*, Department of Haematology, The Prince of Wales Hospital

bFGF induction of an Egr-1-dependent remodelling cascade, Department of Biochemistry, University of Sydney

Endothelial injury and transcriptional activation: bFGF induction of an Egr-1-dependent remodelling cascade, School of Biochemistry and

Molecular Genetics, UNSW*Mechanical injury to vascular endothelium: how is PDGF induced?* Istituto du Scienze Farmacologiche, Facolta di Farmacia, Universita di Milan, Italy

Mechanisms of inducible PDGF transcription in vascular cells, Istituto di Fisiologia Clinica, Universita Degli Studi di Pisa, Santa Anna, Italy

PDGF and endothelium, Heart Research Institute, Camperdown

bFGF-induced PDGF A-chain gene expression in vascular endothelial cells involves transcriptional activation by Egr-1, Annual Symposium of the Baker Medical Research Institute, St Kilda

1996 *Mechanisms controlling platelet-derived growth factor transcription in vascular endothelial cells,* Hanson Centre for Cancer Research, Adelaide

Transcriptional regulation of platelet-derived growth factor gene expression, School of Microbiology and Immunology, UNSW

Mechanisms controlling platelet-derived growth factor expression in endothelial cells, R.W. Johnson Pharmaceutical Research Institute, Rushcutter's Bay

Unravelling the mechanisms of PDGF gene transcription in vascular endothelial cells, School of Pathology, UNSW

Egr-1 as an integrator of multiple extracellular stimuli with inducible endothelial PDGF gene expression. IVth Annual Conference of the Australian Vascular Biology Society, Marysville, Vic

Fluid shear stress and PMA induce endothelial PDGF-A gene expression via the Egr-1 pathway. XVIIIth Scientific Meeting of the Australiasian Society for Experimental Pathology, Sydney

1995 *Transcriptional regulation of platelet-derived growth factor B-chain in vascular endothelial cells*, Vascular Research Division, Department of Pathology, Brigham and Women's Hospital, Harvard Medical School, Boston

Regulation of platelet-derived growth factor gene expression in vascular endothelial cells, Department of Pathology and Laboratory Medicine, Boston University, Boston

Regulation of platelet-derived growth factor gene expression in vascular endothelial cells, Keynote Speaker, Third Annual Symposium of the Australian Vascular Biology Society, Terrigal, NSW

Transcriptional regulation of platelet-derived growth factor in vascular endothelial cells, Department of Pathology, Brigham and Women's Hospital, Harvard Medical School, Boston, MA

1994 *Novel cis-acting elements in the human platelet-derived growth factor B-chain core promoter that mediate gene expression in cultured vascular endothelial cells.* VIIIth International Symposium on the Biology of Vascular Cells, Heidelberg, Germany.

Transcriptional regulation of platelet-derived growth factor and functional consequences of alternative splicing, Istituto di Scienze Farmacologiche, Facolta di Farmacia, Universita di Milan, Italy

The universal language of research, Rotary Club of Wakefield, MA

1993 *PDGF and the extracellular matrix: insights using a synthetic peptide,* Vascular Research Division, Brigham and Women's Hospital, Harvard Medical School, Boston, MA

A research project, Rotary District 7930, Cambridge, MA

1992 *Biological effects of PDGF A-chain exon 6 product: role of extracellular glycosaminoglycan*, First Annual Symposium of the Centre for Thrombosis and Vascular Research, The Prince of Wales Hospital, Randwick

Medical research and me, Annual Conference, Rotary District 9680, Darling Harbour Convention Centre

Art and science: a portrait of a marriage, Rotary Club of Frenchs Forest

1991 *A synthetic peptide corresponding to exon 6 of PDGF A-chain binds to cells and interferes with the binding of several growth factors.* 30th National Scientific Conference, The Australian Society for Medical Research, Canberra

Modulation of mitogenic activity of normal human serum and several growth factors using a synthetic peptide representing exon 6 of PDGF A-chain. 30th National Scientific Conference, The Australian Society for Medical Research, Canberra

A tyrosinated synthetic peptide representing the alternatively spliced exon of the PDGF A-chain binds specifically to cultured cells and interferes with binding of several growth factors. The Australian Society for Biochemistry and Molecular Biology, Canberra

Platelet-derived growth factor: a promiscuous mitogen, Department of Haematology, The Prince of Wales Hospital, Randwick

The art of medical research, Rotary Club of Hunter's Hill

1990 *Platelet-derived growth factor peptide with inhibitory action*, UNSW Blood Club, The Prince of Wales Hospital, Randwick

1989 *Antipeptide monoclonal antibodies are prone to crossreact.* The Australian Society for Immunology, Adelaide

1988 *Structural basis for the crossreactivity of an antipeptide monoclonal antibody*, Department of Haematology, The St George Hospital, Kogarah

OCCUPATIONAL CERTIFICATION

2000 *Radiation Licence* (No. 21239), Environment Protection Authority

Fire Extinguisher Training and Fire Safety, Security Services, UNSW

1998 *Cardio-Pulmonary Resuscitation*, Australian Red Cross, Sydney

1993 *Radiation Safety in the Laboratory*, Brigham and Women's Hospital and Harvard Medical School, Boston, MA

Harvard University Environmental Health and Safety Course, Brigham and Women's Hospital and Harvard Medical School, Boston, MA

PUBLICATIONS AND ABSTRACTS

(a) Articl s

1. Khachigian LM, Evin G, Morgan FJ, Owensby DA, Chesterman CN. A crossreactive antipeptide monoclonal antibody with lysyl-lysine specificity. *Journal of Immunological Methods* 1991; 140:249-258.

2. Khachigian LM, Owensby DA, Chesterman CN. A tyrosinated peptide representing the alternatively spliced exon of the PDGF A-chain binds specifically to cultured cells and interferes with binding of several growth factors. *Journal of Biological Chemistry* 1992; 267:1660-1666.

3. Khachigian LM, Chesterman CN. Synthetic peptides representing the alternatively spliced exon of the PDGF A-chain modulate mitogenesis stimulated by normal human serum and several growth factors. *Journal of Biological Chemistry* 1992; 267:7478-7482.

4. Khachigian LM, Chesterman CN. Platelet-derived growth factor and alternative splicing: a review. *Pathology* 1992; 24:280-290.

5. Khachigian LM, Chesterman CN. Platelet-derived growth factor and alternative splicing: structure and roles in normal growth and pathology. *Platelets* 1993; 4:304-315.

6. Khachigian LM, Chesterman CN. Structural basis for extracellular retention of platelet-derived growth factor A-chain using a synthetic peptide corresponding to exon 6. *Peptides* 1994; 15:133-137.

7. Khachigian LM, Fries JWU, Benz MW, Bonthron DT, Collins T. Novel *cis*-acting elements in the human platelet-derived growth factor B-chain core promoter that mediate gene expression in cultured vascular endothelial cells. *Journal of Biological Chemistry* 1994; 269:22647-22656.

8. Khachigian LM, Collins T, Fries JWUF. Nuclear factor-kB mediates induction of vascular cell adhesion molecule-1 in glomerular mesangial cells. *Biochemical and Biophysical Research Communications* 1995; 206:462-467.

9. Khachigian LM, Field SE, Crouch R, Chesterman CN. Platelet-derived growth factor A-chain synthetic peptide inhibits human glioma xenograft proliferation in nude mice. *Anticancer Research* 1995; 15:337-342.

10. Khachigian LM, Resnick N, Gimbrone MA Jr, Collins T. Nuclear factor-kB interacts functionally with the platelet-derived growth factor B-chain shear-stress-response-element in vascular endothelial cells exposed

to fluid shear stress. *Journal of Clinical Investigation* 1995; 96:1169-1175.

11. Williams AJ, Khachigian LM, Shows T, Collins T. Isolation and characterization of a novel zinc-finger protein with transcriptional repressor activity. *Journal of Biological Chemistry* 1995; 270: 22143-22152.

12. Khachigian LM, Williams AJ, Collins T. Interplay of Sp1 and Egr-1 in the proximal PDGF-A promoter in cultured vascular endothelial cells. *Journal of Biological Chemistry* 1995; 270: 27679-27686.

13. Neish AS, Khachigian LM, Baichwal VR, Park A, Collins T. Sp1 is a component of the cytokine-inducible enhancer in the promoter of vascular cell adhesion molecule-1. *Journal of Biological Chemistry* 1995; 270: 28903-28909.

14. Khachigian LM, Lindner V, Williams AJ, Collins T. Egr-1-induced endothelial gene expression: a common theme in vascular injury. *Science* 1996; 271:1427-1431.

15. Field SL, Khachigian LM, Sleigh MJ, Yang G, Vandermark SE, Hogg PJ, Chesterman CN. Extracellular matrix is a source of mitogenically active platelet-derived growth factor. *Journal of Cellular Physiology* 1996; 168:322-332.

16. Khachigian LM. Immune functions in the vessel wall: advances in vascular biology, Vol 2. (Vadas MA, Harlan J, eds.), Harwood Academic Publishers, Amsterdam, 1996. *Immunology and Cell Biology* 1997; 75:519-520.

17. Gimbrone MA Jr, Resnick N, Nagel T, Khachigian LM, Collins T, Topper JN. Hemodynamics, endothelial gene expression and atherogenesis. *Annals New York Academy of Sciences* 1997; 811:1-11.

18. Khachigian LM, Anderson K, Halnon N, Gimbrone MA Jr, Resnick N, Collins T. Shear-induced endothelial platelet-derived growth factor A-chain gene expression involves Egr-1. *Arteriosclerosis, Thrombosis and Vascular Biology* 1997; 17:2280-2286.

19. Yang M, Khachigian LM, Hicks C, Chesterman, CN, Chong BH. Identification of PDGF receptors on human megakaryocytes and megakarocytic cell lines. *Thrombosis and Haemostasis* 1997; 78:892-896.

20. Silverman ES, Khachigian LM, Lindner V, Williams AJ, Collins T. Inducible PDGF A-chain transcription in vascular smooth muscle cells

is mediated by Egr-1 displacement of Sp1 and Sp3. *American Journal of Physiology* 1997; 42:H1415-H1426.

21. Delbridge GJ, Khachigian LM. Heparin binding growth factor-1-induced platelet-derived growth factor A-chain gene expression in vascular endothelial cells involves transcriptional activation by Egr-1. *Circulation Research* 1997; 81:282-288.

22. Khachigian LM, Collins T. Inducible expression of Egr-1-dependent genes: a paradigm of transcriptional activation in vascular endothelium. *Circulation Research* 1997; 81:457-461.

23. Khachigian LM, Collins T, Fries JWUF. VCAM-1 expression in mesangial cells *in vivo* is regulated by a redox-sensitive mechanism involving NF-kB. *American Journal of Pathology* 1997; 151:1225-1229.

24. Resnick N, Yahav H, Khachigian LM, Collins T, Anderson KR, Dewey FC, Gimbrone MA Jr. Endothelial gene regulation by laminar shear stress. *Advances in Experimental Medicine & Biology* 1997; 430:155-164.

25. Khachigian LM, Collins T. Early growth response factor-1: a pleiotropic mediator of inducible gene expression. *Journal of Molecular Medicine* 1998; 76:613-616.

26. Sumpio BE, Du W, Galagher G, Wang X, Khachigian LM, Collins T, Gimbrone MA Jr, Resnick N. Regulation of PDGF-B in endothelial cells exposed to cyclic strain. *Arteriosclerosis, Thrombosis and Vascular Biology* 1998; 18:349-355.

27. Rafty LA, Khachigian LM. Zinc finger transcription factors mediate high constitutive PDGF-B expression in smooth muscle cells derived from aortae of newborn rats. *Journal of Biological Chemistry* 1998; 273:5758-5764.

28. Lowe HL, Chesterman CN, Khachigian LM. Left main coronary artery stenosis after percutaneous transluminal coronary angioplasty: importance of remaining "minimally invasive". *Catheterization and Cardiovascular Interventions* 1999; 46:254-255.

29. Santiago FS, Lowe HC, Day FL, Chesterman CN, Khachigian LM. Endothelial injury triggers FGF-2 release and a signaling cascade involving MAPK and Egr-1. *American Journal of Pathology* 1999; 154:937-944.

30. Khachigian LM, Santiago FS, Rafty LA, Chan OLW, Delbridge GJ, Bobik A, Collins T, Johnson AC. GC factor 2 represses platelet-

derived growth factor A-chain transcription and is itself induced by arterial injury. *Circulation Research* 1999;84:1258-1267.

31. Khachigian LM, Silverman ES, Lindner V, Williams AJ, Chesterman CN, Collins T. Platelet-derived growth factor and the pathogenesis of atherosclerosis. In: Platelets, Thrombosis and the Vessel Wall, Vol III, *Advances in Vascular Biology* (MC Berndt, ed.). 1999. Harwood Academic, Switzerland. pp. 267-286.

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(c) Patents

1. Inventor: Unisearch Limited (A/Prof Levon Khachigian)
Australian Provisional Patent Application:
Provisional No: PS0780
Title: *DNAzyme Therapeutics*
Filing Date: 27/03/02

2. Inventor: Unisearch Limited (A/Prof Levon Khachigian)
Australian Provisional Patent Application:
Provisional No: PN8554
Title: *Prevention of proliferation of vascular cells*
Filing Date: 07/03/96
Australian Patent:
Patent Application No.: 20865/97
Patent No.: 707943
Complete Filing Date: 07/03/97
International Patent:
PCT No: PCT/AU97/00140
Filing Date: 07/03/97
International Publication No: WO 97/ 32979
Other National Patent/Patent Applications:
Canada: 2248350
Europe: 97906032.4
Japan: 09-531259
US (Granted Patent): 6200960 (Mar 13, 2001)
South Africa: 97/2000

3. Inventor: Unisearch Limited (A/Prof Levon Khachigian)
Australian Provisional Patent Application:
Provisional No: PP8103
Title: *Catalytic molecules*
Filing Date: 11/01/99
Australian Patent:
Patent Application No: 24238/00

Patent No: Pending
Complete Filing Date: 11/01/00
International Patent:
PCT No: PCT/AU00/00011
Filing Date: 11/01/2000
International Publication No: WO 00/ 42173
Other National Patent/Patent Applications:
Canada: TBA
Europe: 00902488.6
Japan: 2000-593730
New Zealand: 512805
US: 09/889075

4. Inventor: Unisearch Limited (A/Prof Levon Khachigian)
Australian Provisional Patent Application:
Provisional No: PQ3614
Title: *Treatment of asthma*
Filing Date: 22/10/99
Status: Lapsed
Australian Provisional Patent Application:
Provisional No: PQ3738
Title: *Treatment of asthma II*
Filing Date: 29/10/99
Status: Lapsed

5. Inventor: Unisearch Limited (A/Prof Levon Khachigian)
Australian Provisional Patent Application:
Provisional No: PQ3676
Title: *Treatment of cancer*
Filing Date: 26/10/99
Australian Patent:
Patent Application No: 11169/01
Patent No: TBA
Complete Filing Date: 26/10/00
International Patent:
PCT No: PCT/AU00/01315
Filing Date: 26/10/00
International Publication No: WO 01/30394

6. Inventor: Unisearch Limited (A/Prof Levon Khachigian)
Australian Provisional Patent Application:
Provisional No: PR5185
Title: *Yin yang-1*
Filing Date: 22/05/01

7. Inventors: Unisearch Limited (Prof Colin Chesterman and Levon Khachigian)
Australian Provisional Patent Application: PK5890
Title: *Novel peptide*

Filing Date: 1991
Status: Lapsed

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